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FINAL REPORT

JAN HERMANS

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1988 GORDON RESEARCH CONFERENCE ON PROTEINS

Final Report

Army Grant No. DAMD17-88-Z-8026

The Gordon Conference on "Proteins" was held from the 20th to the 24th of June, 1988 at Salve Regina College in Newport, Rhode Island. The conference had 103 participants; nine were from foreign countries. There was a good mixture of scientists from universities, national laboratories, and private industries. Many younger scientists, including graduate students and postdoctoral fellows, attended.

Several subjects related to structure and function of proteins were discussed in the sessions at this conference. Topics included: What Can Peptides Tell Us About Proteins (and Vice Versa)?; New Methods in Structure Determination; The Life and Death of a Protein, Serine Proteases, Paradigm Shifts, Holes and Loops in Proteins, Membrane Proteins and Receptors; and G Proteins. The Thursday evening slot was filled by Don Wiley, who spoke on structures of membrane proteins. There were thirty speakers and eight discussion leaders, and although the meeting as a whole seemed to go well, fewer talks, especially in the evening sessions, would be preferable. Nonetheless, there was ample discussion after each talk and in the free time. Questions posed of the speakers were generally penetrating and enhanced the scientific exchange appreciably.

While there were many outstanding talks and results presented, particularly significant were the successful design of proteins de novo, either as a linear chain (Lynn Regan's work) or in a "template-directed" manner (Manfred Mutter's work), the characterization of a domain of BPTI that mimics one of the folding intermediates of the whole protein (P. Kim), new methods including IR-CD (Keiderling), and new structures including a chemotactic protein (A. Stock) and arepressor-operator complex (Pabo). In the choice of topics for this meeting, a conscious effort was made to include more biological issues related to proteins, and this effort paid off in three very successful sessions: the in vivo story of protein folding and degradation (Fred Goldberg, discussion leader), membrane proteins and receptors (Catherine Strader, discussion leader), and G proteins (Irving Sigal, discussion leader).

Poster sessions were held every afternoon, with about 50 participants presenting work. The posters were mounted all week, giving ample time for everyone to see and discuss posters. Feedback from the poster sessions was uniformly enthusiastic.

Overall, response to this meeting has been very positive.

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"Proteins" Gordon Conference, June 20-24, 1988, Salve Regina College, Rhode Island
Lila Gierasch and Jan Hermans, Co-Chairs

Monday Morning: What can Peptides Tell us About Proteins (and Vice Versa)?

Peter Kim, MIT (Discussion Leader) "Synthetic Protein Folding Intermediate Analogs"
Manfred Mutter, Basel "Construction of Artificial Proteins"
George Rose, Penn. State, Hershey "Helices in Peptides and Proteins"
Tom Alber, Univ. of Utah "Effects of Mutations on Protein Stability and Structure"

Monday Evening: New Methods in Structure Determination

Stan Opella, Univ. of Pennsylvania (Discussion Leader) "Solid State NMR"
Angela Gronenborn, NIH "2D and 3D NMR of Proteins"
Tim Keiderling, Univ. of Illinois, Chicago "Vibrational Circular Dichroism"
Elisha Haas, Weizmann Institute "Fluorescence Energy Transfer Studies of Protein Folding"

Tuesday Morning: The Life and Death of a Protein

Fred Goldberg, Harvard Medical (Discussion Leader) "ATP-Dependent Proteases"
Aaron Ciechanover, Technion-Israel Institute "Ubiquitin-Dependent Protein Breakdown"
Steve Clarke, UCLA "Repair Mechanisms for Aging Proteins"
Martin Eilers, UCSF "Protein Unfolding During Transport into Organelles"

Tuesday Evening: Serine Proteases

Jonathan Greer, Abbott (Discussion Leader) "Homology-Based Structure Prediction"
Robert Fletcher, UCSF "Enzyme Studies by Mutagenesis"
Arieh Warshel, USC "Computer Simulation of Genetically-Modified Serine and Cysteine Proteases"
Mike James, Univ. of Alberta "Computer Modeling of Serine Proteases"

Wednesday Morning: Paradigm Shifts

C. Schutt, Princeton (Discussion Leader)
Anne Stock, Princeton "Structure of A Phosphorylated Response Regulator"
Lynne Regan, DuPont "A Helical Protein Designed from First Principles"
Maria Max, Beckman Research Institute "Mutagenesis as a Probe of Functionally Important Conformational Changes"
Carl Pabo, Johns Hopkins "Structure of the Lambda Repressor-Operator Complex"
Philip Bryan, Genex "Analysis of an Engineered Thermally Stable Mutant of Subtilisin"

Wednesday Evening: Holes and Loops in Proteins

George Rose, Penn State, Hershey (Discussion Leader)
Jacque Fetrow, MIT "Loops in Globular Proteins"
Jay Ponder, Yale "Tertiary Templates for Protein Design"
Bob Tilton, Scripps "Cavities in Proteins by Gas Binding"
Tony Kossiakoff, Genentech "Solvent Structure in Natural and Engineered Cavities in Proteins"

Thursday Morning: Membrane Proteins and Receptors

Catherine Strader, Merck (Discussion Leader)
Michael Schimerlik, Oregon State "Atrial Muscarinic Acetylcholine Receptor"
Leland Ellis, UT Southwestern, Dallas "Structure-Function of Insulin Receptor"
Nigel Unwin, MRC "Receptors and Channels"
Catherine Strader, Merck "Structure-Function of β -Adrenergic Receptor"

Thursday Evening:

Business meeting
Don Wiley, Harvard "Recognition at Membrane Surfaces: Influenza Virus HA, Human HLA"

Friday Morning: G Proteins

Irving Sigal, Merck (Discussion Leader)
Fran Jurnak, UC Riverside "Structural Studies of EF-Tu"
Susan Masters, UCSF "Mutational Analysis of G Proteins"
Abraham DeVos, UC Berkeley "The Structure of the α Oncogene Protein"
Irving Sigal, Merck "Mutagenesis Studies of α Protein"

GORDON RESEARCH CONFERENCES

PROTEINS

June 20-24, 1988
Salve Regina College
Newport, RI

Registration List

Aisaka, Kazuo Beckman Research Institute Division of Biology 1450 E. Duarte Rd., Duarte, CA 91010	101A	Canfield, Norman Lederle Laboratories Bldg., 110, Room 614 North Middletown Rd., Pearle River, NY 10965	106B
Aisaka, Mrs. (wife)	101A	Chazin, Walter Research Institute of Scripps Clinic Dept. of Molecular Biology (MB2) 10666 North Torrey Pines Rd., La Jolla, CA 92037	107B
Aisaka, (Son)	101A		
Alber, Tom University of Utah School of Medicine Dept. of Biochemistry 50 North Medical Drive Salt Lake City, UT 84132	103B	Chen, Shiuan Beckman Research Inst., of City of Hope Division of Immunology Duarte, CA 91010	107B
Bierzynski, Andrzej New York University Dept. of Chemistry 4 Washington Place New York, NY 10003	104B	Chlebowski, Jan Virginia Commonwealth University Biochemistry Dept. 1102 East Marshall St., Richmond, VA 23298-0614	311B
Briggs, Martha S. University of Pennsylvania Dept. of Biochemistry & Biophys. Philadelphia, PA 19104-6059	207B	Clarke, Neil Johns Hopkins Univ., School of Medicine Dept. of Molecular Biology & Genetics Baltimore, MD 21205	201B
Bright, Harold Office of Naval Research Code 1141, MB, Biological Sciences Div., 800 North Quincy St., Arlington, VA 22217-5000	310B	Clarke, Steven UCLA Dept. of Chemistry, & Biochemistry Los Angeles, CA 90024-1569	313B
Bryan, Philip Genex Corporation 16020 Industrial Dr., Gaithersburg, MD 20877	105B	Findeis, Mark A. Rockefeller University Lab. Biorganic Chemistry & Biochemistry 1230 York Ave., Box 113 New York, NY 10021	203B
Bryant, Stephen H. Brookhaven National Lab. Protein Data Bank Chemistry Dept. Upton, NY 11973	106B	Hughson, Fred Stanford University Medical Center Dept. of Biochemistry Stanford, CA 94305	211B
Campbell-Burk, Sharon Dupont Expt. Station E328, B48A Wilmington, DE 19898		Hunt, John Yale University Dept. of MB&B, 607 JWG 260 Whitney, CT 06511	

Proteins
Registration List
Page 2

<p>Dodson, M.L. 305A Vanderbilt University Medical School Dept. of Biochemistry 21st Ave., & Garland Nashville, TN 37232</p>	<p>Fetrow, Jacquelyn S. 205B Whitehead Institute 9 Cambridge Center Cambridge, MA 02142</p>
<p>Down, James 314B Harvard University Biochemistry Box 95, Divinity Ave., Cambridge, MA 02138</p>	<p>Fletterick, Robert 104A University of California Dept. of Biochemistry San Francisco, CA 94143</p>
<p>Eigenbrot, Charles 202B University of California Genetech/Biomolecular Chemistry 460 Pt. San Bruno Blvd. South San Francisco, CA 94080</p>	<p>Gariepy, Jean 206B University of Toronto Dept. of Medical Biophysics 500 Sherbourne St., Toronto, Ontario M4X 1K9 CANADA</p>
<p>Eilers, Martin 304B University of San Francisco George Willam Hooper Foundation Visiting Scientist San Francisco, CA 94143</p>	<p>Gierasch, Lila 207B University of Texas Southwestern Medical Center Dept. of Pharmacology 5323 Harry Hines Blvd., Dallas, TX 75235-9041</p>
<p>Ellis, Leland 315B Howard Hughes Medical Institute Dept. of Biochemistry 5323 Harry Hines Blvd. Dallas, TX 75235-9050</p>	<p>Goldberg, Alfred L. Non-Res. Harvard Medical School Dept. of Cellular & Molecular Phys. 240 Longwood Ave., Boston, MA 02115</p>
<p>Englander, S. Walter 203B University of Pennsylvania Dept. of Biochemistry & Biophys. Philadelphia, PA 19104</p>	<p>Goldsmith, Elizabeth J. 305B Univ. Texas So'western Medical Center At Dallas 5323 Harry Hines Blvd. Dallas, TX 75235-9050</p>
<p>Epps, Dennis E. 204B The Upjohn Company 7255-209-1 7000 Portage Kalamazoo, MI 49001</p>	<p>Goodman, Elizabeth M. 101B Whitehead Institute/MIT 9 Cambridge Center Cambridge, MA 02142</p>
<p>Epstein, Linda 301B Tufts University School of Medicine Dept. of Biochemistry 136 Harrison Ave., Boston, MA 02111</p>	<p>Graves, Bradford J. 206B Hoffman-La Roche Inc. Dept. of Physical Chemistry Bldg. 76/15 Nutley, NJ 07110</p>
<p>Fasman, Gerald D. 103A Brandeis University Graduate Dept. of Biochemistry Waltham, MA 02254</p>	<p>Gronenborn, Angela M. 306A Max Planck Institut fur Biochemie D8033 Martinsried, BEI Munchen WEST GERMANY</p>

Proteins
Registration List
Page 3

Haas, Elisha Bar-Ilan University	210A	Keiderling, Tim University of Illinois at Chicago Dept. of Chemistry M/C111 Box 4348 Chicago, IL 60680	307A
Hamilton, James A. Boston University School of Medicine Biophysics Institute 80 East Concord St., R 111 Boston, MA 02118-2394	208B	Kelley, Robert Genentech, Inc., Biomolecular Chemistry Dept. 460 Point San Bruno Blvd. So. San Francisco, CA 94080	211B
Hardman, Karl D. Genex Corporation 16020 Industrial Dr., Gaithersburg, MD 20877	105B	Kim, Peter S. Whitehead Inst. (M.I.T.) Nine Cambridge Center Cambridge, MA 02142	103B
Hassell, Annie Smith, Kline & French - L110 Macromolecular Science Dept. P.O. Box 1539 King of Prussia, PA 19406-0939	210B	King, Jonathan Massachusetts Institute of Technology Dept. of Biology Cambridge, MA 02139	201A
Havel, Henry A. The Upjohn Co., 7822-259-22 7000 Portage Ave Kalamazoo, MI 49001	204B	Klotz, Alan V. Louisiana State University Dept. of Biochemistry Baton Rouge, LA 70803	212B
Hermans, Jan University of North Carolina Dept. of Biochemistry Chapel Hill, NC 27514	102B	Konishi, Yasuo Monsanto Co., 700 Chesterfield Village Pkwy. St. Louis, MO 62198	202A
James, Michael University of Alberta Dept. of Biochemistry Edmonton, Alberta T6G 2H7 CANADA	106A	Kossiakoff, Anthony Genentech Inc. Dept. of Biomolecular Chemistry 460 Point San Bruno Blvd. So. San Francisco, CA 95080	202B
Jurnak, Frances University of California Biochemistry Dept. Riverside, CA 92521	306A	Lark, Laura Univ. Texas Southwestern Medical Cntr. Dept. of Pharmacology 5323 Harry Hines Blvd. Dallas, TX 75235-9041	210B
Kalvin, Douglas M. Nova Pharmaceutical Corp. 6200 Freeport Centre Baltimore, MD 21224-2700	313A	Lattman, Eaton Johns Hopkins Medical School Dept. of Biophysics Baltimore MD 21205	315A
Kang, Sungzong Mt. Sinai School Med/VA Med. Ctr. 130 West Kingsbridge Rd., Bronx, NY 10468	107A	Lehrman, Russ The Upjohn Company Control Biotechnology 7000 Portage Ave., Kalamazoo, MI 49001	203A

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Registration List
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Markland, William Integrated Genetics 31 New York Ave., Framingham, MA 01701	204A	Ogata, Craig Columbia University, Howard Hughes Medical Institute Dept. of Biochemistry 630 West 168th St., BB #523 New York, NY 10032	215B
Marqusee, Susan Stanford University Dept. of Biochemistry Stanford, CA 94305	213B	Opella, Stanley University of Pennsylvania Dept. of Chemistry Philadelphia, PA 19101	101A
Mayne, Lelend University of Pennsylvania Dept. of Biochemistry & Biophys. Philadelphia, PA 19104	214B	Pabo, Carl Johns Hopkins Medical School Dept. of Molecular Biology Baltimore, MD 21205	209A
Mitraki, Anna M.I.T. Dept. of Biology 77 Massachusetts Ave., Cambridge, MA 02139	206A	Pakula, Andrew Mass. Inst. of Technology Dept. of Biology Bldg. 16, Rm. 833 Cambridge, MA 02139	215B
Mutter, Manfred University of Basel St. Johans Ring 12 CH4056 Basel SWITZERLAND	Non Res	Parsell, Dawn M.I.T. 16-839, Dept. of Biology 77 Massachusetts Ave. Cambridge, MA 02139	301b
Nelson, Jeffrey W. Louisiana State University Dept. of Biochemistry 322 Choppin Hall Baton Rouge, LA 70803	207A	Ponder, Jay W. Yale University Molecular Biophysics & Biochemistry Kline Biology Tower New Haven, CT 06511	302B
Niteki, Danuta E. Cetus Corporation 1400 53rd. Street Emeryville, CA 94608	208A	Presta, Leonard Penn. State Univ. Medical Center Dept. Biological Chemistry P.O. Box 850 Hershey, PA 17033	302B
O'Shea, Erin K. Whitehead Institute/MIT 9 Cambridge Center Cambridge, MA 02142	101B	Rackovsky, Shalom U. Rochester School of Medicine & Dentistry Dept. of Biophysics Rochester, NY 14642	210A
Oas, Terence G. Massachusetts Institute of Tech. Whitehead Inst. 9 Cambridge Center Cambridge, MA 02139	214B	Radzicka, Anna University of North Carolina Biochemistry Dept., 405 Flob 231 H Chapel Hill, NC 27599-7260	308A

Proteins
Registration List
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Raghavendra, K University of Connecticut Dept. of Molecular & Cell Biology Box U-125, No. Eagleville Rd. Storrs, CT 06268	303B	Zehfus, Michael University of Wisconsin Department of Biochemistry 420 Henry Mall Madison, WI 53706	305A
Raghavendra, Mrs (Spouse)	303B	Schutt, C. E. Princeton University Department of Chemistry Washington Road Princeton, NJ 08540	214A
Regan, Lynne E.I. DuPont De Nemours & Co., Inc. Experimental Station 328/B47 Wilmington, DE 19898	308A	Sigal, Irving S. Merck, Sharp & Dohme Research Labs. BL16-101 West Point, PA 19486	201B
Roise, David A University of California, San Diego Dept. of Chemistry D-006 La Jolla, CA 92093	304B	Smith, John A. Massachusetts General Hospital Department of Molecular Biology 50 Blossom Street Boston, MA 02114	215A
Rose, George Penn State University Hershey Medical Center Dept. of Biological Chemistry Hershey, PA 17033	211A	Sprang, Stephen UT Southwestern Medical Center Howard Hughes Medical Institute Biochemistry, 5323 Harry Hines Boulevard Dallas, TX 75235-9050	305B
Sauter, Nicholas K. Harvard University Biophysics Committee 7 Divinity Ave. Cambridge, MA 02138	212A	Staley, Jonathan P. Whitehead Institute/MIT 9 Cambridge Center Cambridge, MA 02142	306B
Schevitz, Richard Eli Lilly & Company Lilly Corporate Center Indianapolis, IN 46285-1513	315A	States, David J. National Institutes of Health Building 10, Room 6D10 9000 Rockville Pike Bethesda, MD 20892	314A
Schimerlik, Michael Oregon State University Dept. Biochemistry & Biophysics Corvallis, OR 97331	213A	Stock, Anne Princeton University Department of Molecular Biology Princeton, NJ 08544	307B
Wurzburg, Beth A. Harvard University Dept. of Biochemistry & Molecular Biology 7 Divinity Avenue Cambridge, MA 02138	303A	Strader, Catherine D. Merck Sharp & Dohme Research Labs. Department of Biochemistry 8QM-216 Rahway, NJ 07065	310A
Yu, Myeong-Hee Genetic Engineering Center PO Box 131 Cheongryang Seoul Korea	304A		

Proteins
Registration List
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Stock, Jeff Princeton University Molecular Biology Department Princeton, NJ 08544	307B	Wiley, Don Howard Hughes Medical Institute Harvard University Department of Biochemistry/Molecular Biology Cambridge, MA 02138	302A
Talib, Sohel Applied Immune Sciences 200 Constitution Drive Menlo Park, CA 94025	306B		
Texter, Frieda Albright College Department of Chemistry PO Box 15234 Reading, PA 19612	205B	<u>LATE ARRIVALS:</u>	
Tilton, Robert Miles Inc. Research Division 400 Morgan Lane West Haven, CT 06516	308B	Ciechanover, Aaron Technion - Faculty of Medicine Dept. of Biochemistry P.O. Box 9649 Haifa 31096 ISRAEL	312B
Udgaonkar, Jayant Stanford University School of Medicine Stanford, CA 94305	308B	Greer, Jonathan Abbott Laboratories Dept. 47E, Bldg. AP9A Abbott Park, IL 60064	105A
Unwin, Nigel MRC Lab of Molecular Biology Hills Road Cambridge UK	314A	Lin, Tiao-Yin Whitehead Institute MIT Nine Cambridge Center Cambridge, MA 02142	213B
Van Oostrum, Jan Ciba-Geigy Ltd. Biotechnology, K681.5.45 4002 Basle Switzerland	309B		
Warshel, Arie University of Southern California Department of Chemistry Los Angeles, CA 90089	301A		
Walsh, Mary T. Boston University School of Medicine Biophysics Institute 80 East Concord Street Boston, MA 02118	206A		